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10. The Spilecco site

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The Spilecco locality (Fig. 1) is mainly known for its contribution to the regional stratigraphy since Fabiani (1912) erected the “Spilecciano” stage to fill the gap between the Cretaceous Scaglia Rossa and the alleged Middle Eocene “Calcari nummulitici”. For the most complete description of the “Spilecciano” in its type locality (the Spilecco hill) we refer to Barbieri & Medizza (1969) and to Medizza (1980). Based on calcareous nannofossil data of Barbieri & Medizza (1969), the succession ranges the NP 9

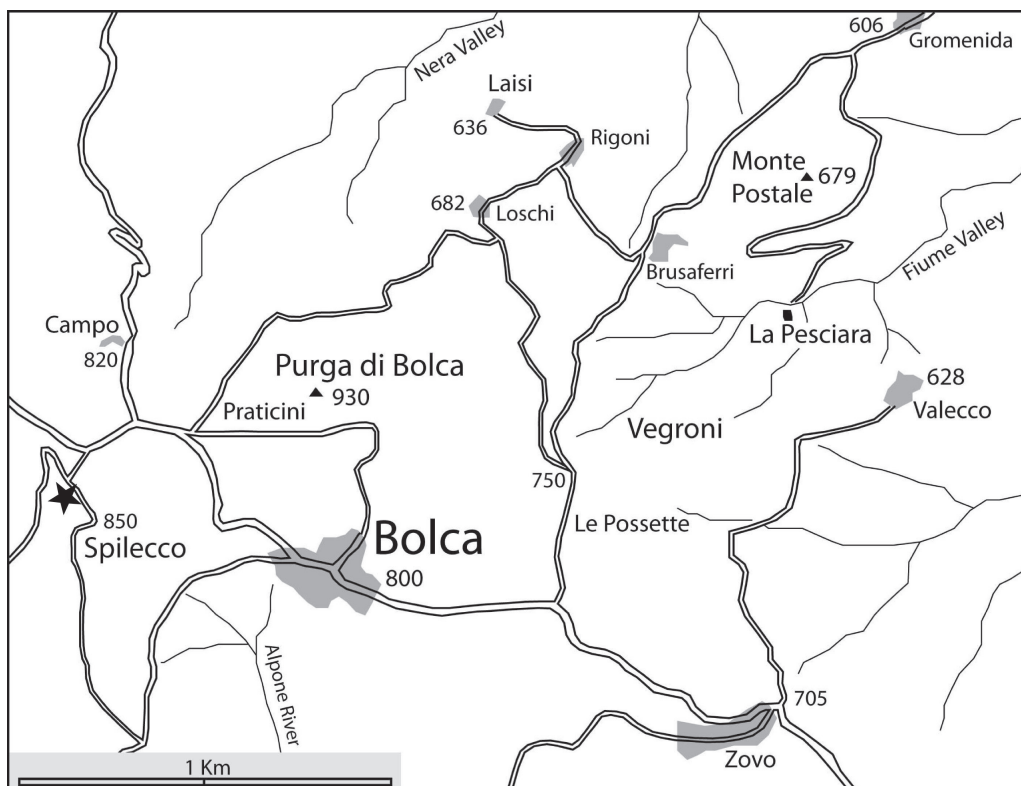


FIG. 1 - Sketch map indicating the position (star) of the Spilecco outcrops near Bolca (Verona).

(Thanetian)-NP 12 (Ypresian) Zones, lacking completely the NP 11 (Fig. 2). The Lower Paleocene is only represented within some burrows into the uppermost part of the Scaglia Rossa, filled in by sediments with Danian planktonic foraminifera (Barbieri & Medizza, 1969). The starting of shallow-water sedimentation in this area (and in the whole Lessini Shelf) is testified by the resedimented periplatform deposits with larger foraminifera,

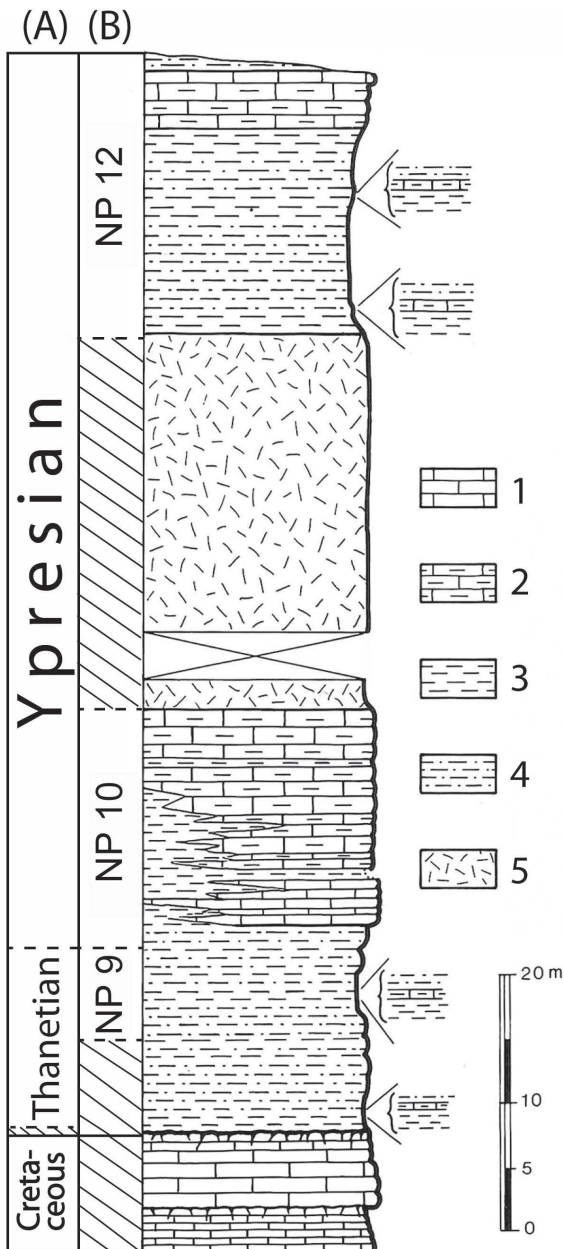


FIG. 2 - Reconstruction of the succession of Spilecco Hill (modified after Medizza, 1980). Based on previous data of Barbieri & Medizza (1969) Legend: 1) Limestones; 2) Clayey limestones and calcareous marls; 3) Clayey marls and volcanic clays; 4) Bedded volcanoclastic rocks; 5) Hyaloclastites. A) Chronostratigraphy; B) Calcareous Nannofossil Zonation of Martini (1971) based on data of Barbieri & Medizza (1969).

crinoids, brachiopods, and shark teeth, ascribed to the SBZ 7 (Trevisani & Papazzoni, 2003), NP 10, and P5 (Barbieri & Medizza, 1969), or lower Ypresian.

At present, only the uppermost part of the gray-green limestones with planktonic foraminifera and the characteristic reddish marly limestones with macrofossils and larger foraminifera still crop out. They approximately correspond to the NP 9-NP 10 portion of the stratigraphic column in Fig. 2.

THE INVERTEBRATES

In the reddish marly limestones, the most abundant invertebrates are the larger foraminifera. They include *Nummulites bolcensis*, *N. spileccensis*, *N. oppenheimi*, *N. pernotus*, *Assilina custugensis*, *Discocyclus tenuis*, *Orbitoclypeus multiplicatus*, *O. munieri*, *O. schopeni*, *Asterocyclus taramellii*. *N. bolcensis* and *N. spileccensis* are endemic species, rarely recorded out of the type locality and needing a taxonomic revision (Trevisani & Papazzoni, 2003).

The crinoids are quite abundant in the reddish marly limestones. The most characteristic taxa are *Conocrinus suessi*, *Conocrinus thorenti* and *Holopus spileccense* (e.g., Massalongo, 1850; Fabiani, 1915; Manni, 2005). *H. spileccense* is a very rare species and it is only known from the “Spilecciano” rocks of Spilecco (Manni, 2005).

The echinoid remains are also common. Based on two spines, Dames (1878) erected the species *Cidaris spileccensis*, subsequently cited by Fabiani (1915).

The brachiopods are the most characteristic macrofossils from Spilecco and have been studied for the first time by Abramo Massalongo (1850), who described two species from the site: “*Terebratulina bolcensis*” and “*T. polymorpha*”. Massalongo figured the two species in his plate 19 of the never published “Compendium Faunae et Florae fossilis Bolcensis”. These taxa have been later described in more detail and figured by Davidson (1870). According to Fabiani (1913) and Altichieri (1992), the brachiopods occurring at Spilecco are *Erymnaria bolcensis*, *E. polymorpha*, “*Terebratulina fumanensis*”, and, dubitatively, *Terebratulina striata* (Figs 3a-g).

Braga (1968) studied the bryozoans from the reddish marly limestones of Spilecco. The assemblage is dominated by *Quadricellaria* sp., *Sertella beaniana*, *Entalophora* cf. *macrostoma*, *Filisparva* sp., *Idmonea* sp., *Tervia* sp., and *Ceriopora* sp. Such bryofauna is the oldest so far recovered in the Paleogene of the Veneto region and shares significant affinities with Upper Cretaceous-Paleocene bryofaunas of the Northern basins (Braga, 1968). Based on larger foraminifera and bryozoan content, the author hypothesized a depositional depth of one hundred meters for the “red marls” of Spilecco.

Massalongo (1850) and Fabiani (1915) listed the following mollusks from Spilecco: *Terebellum*, *Cypraea*, *Helix*, *Crassatella*, and the nautiloid *Aturia ziczac*. At Spilecco also solitary corals occur, ascribed by Massalongo (1850) to “*Turbinolia*”.

THE VERTEBRATES

In the reddish marly limestones from Spilecco the shark teeth are quite common (Fig 3h-l). They were reported since the 19th century (e.g., Massalongo, 1850; Bassani, 1876; D’Erasmus, 1922) and the most updated taxonomical list can be found in Roccaforte et al. (1994): *Ginglymostoma* cf. *serra*, *Carcharias hopei*, *C. macrotia*, *Isurus* cf. *mantelli*, *Lamna obliqua*, *Mustellus spileccensis*, *Notidanus serratissimus*.

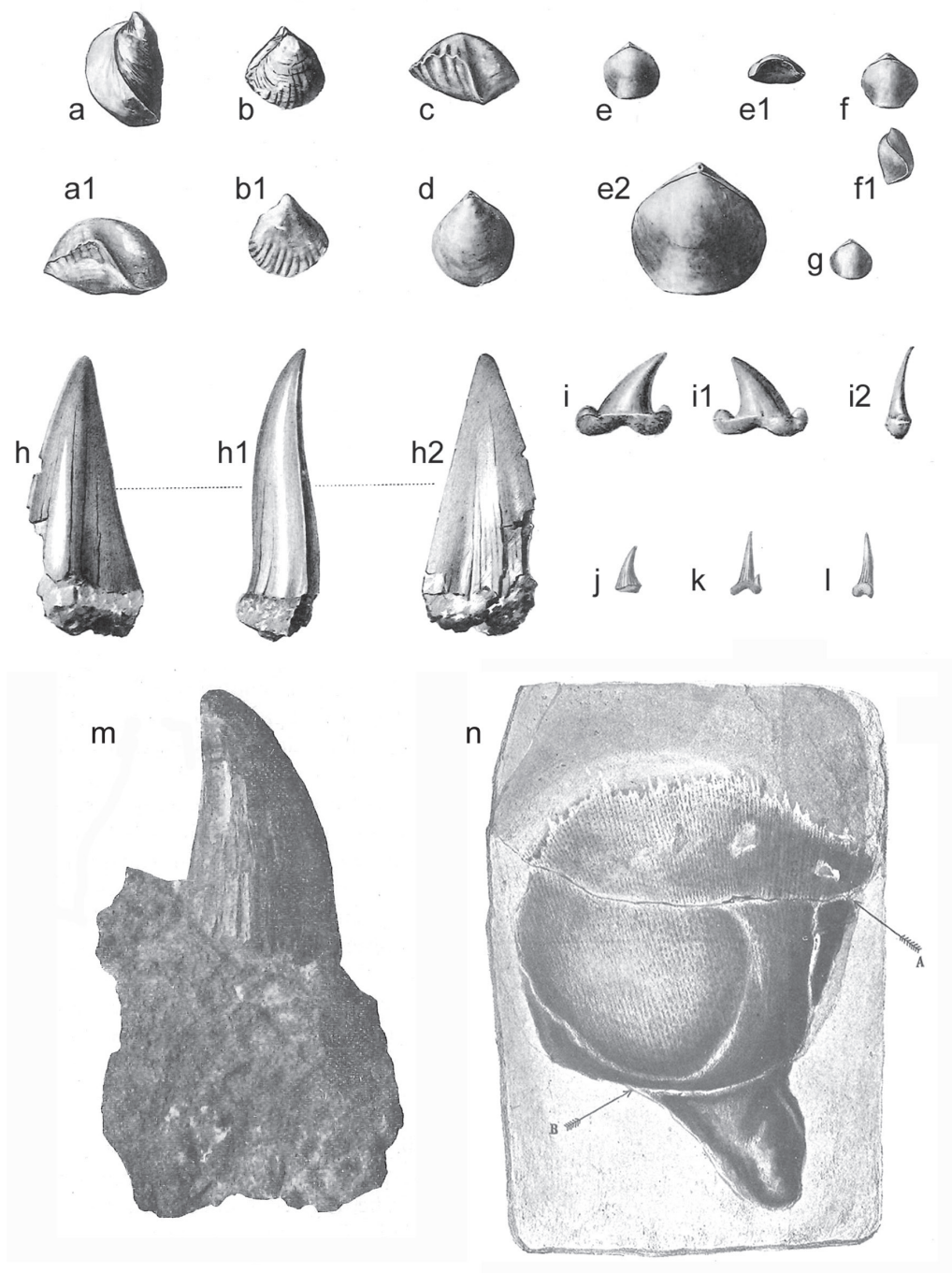


FIG. 3 - Some macrofossils from the “Spilecciano” of Spilecco. Brachiopods: a-d) *Erymnaria polymorpha* (Massalongo, 1850); e-g) *Erymnaria bolcensis* (Massalongo, 1850). Shark and reptile teeth: h) *Isurus* cf. *mantelli* (Agassiz, 1833-1844); i) *Lamna obliqua* (Agassiz, 1833-1844); j-l) *Carcharias macrota* (Agassiz, 1833-1844). m) The supposed mosasaurian tooth from Spilecco. Approximate height of the specimen ca. 4 cm. Green algae: n) *Avrainvilleopsis cyathiformis* (Massalongo 1855-1856) Forti, 1926. Approximate height of the specimen ca. 13 cm. [All the figures are excerpts from original illustrations of Nicolis (1907), Fabiani (1913), D’Erasmus (1922) and Forti (1926)].

From Spilecco an alleged crocodylian tooth is reported by Medizza (1980) and Kotsakis et al. (2004). This specimen (Fig. 3m) has been originally referred to a mosasaur (Nicolis, 1907 p. 36-37), but the early Paleogene age of the Spilecco succession led later authors to discard the mosasaurian nature of the fossil. Such controversy is still unsolved, waiting for a careful taxonomic and micropaleontological investigation of the fossil.

THE FLORA

Massalongo (1855-1856) described the occurrence of several “algae” at Spilecco, most of them controversial and more likely referable to ichnofossils, such as *Halimedopsis tuna* and *Spartophycos funalis* (Massalongo, 1859; Forti, 1926; Fiore, 1936). Forti (1926) revised *Cylindrites cyathiformis* Massalongo, erecting the new genus *Avrainvilleopsis* (Fig. 3n), which is compared to the recent udoteacean green alga *Avrainvillea*.

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